



Customer: Sounddogs.com, Inc.

Web Site: www.sounddogs.com

Location: Santa Monica, CA

Industry: Media and Entertainment

Partner: Brite Global, Inc.

Web Site: www.briteglobal.com

Solution: B2C Electronic Commerce

Audience: Business Decision Makers

Software and Services:

Windows Server 2003

Microsoft Exchange Server

Microsoft ISA Server

Microsoft SQL Server 2005

Microsoft Visual Studio

Microsoft Visual Basic

Microsoft Visual C#

Microsoft Visual C++

Microsoft Internet Information Services

Sounddogs.com uses Microsoft Visual Studio as a Vital Part of their e-commerce solution

"We used Visual C++ to create a library that converts sound files to user-defined formats."


Aric Levin, VP of Technology and Chief Software Architect

When Sound Dogs, Inc. needed a new revenue stream to finance the ongoing development of its sound effects and production music library, it decided that e-commerce was the answer. Sounddogs.com is the first sound effects and production music library that gives users the ability to search for, order, purchase and retrieve sound effects over the Web. Using the Microsoft Windows DNA platform (Microsoft's Web solution platform), Sound Dogs was able to quickly deploy a high-performance, easily scalable solution that provides a rich user experience and the solid reliability its customers expect.

The situation

Have you ever wondered where all the door slams, barking dogs, crowd noises, gunshots, and honking horns you hear in today's motion pictures come from? An increasing number of them are created at Sound Dogs, Inc., one of Hollywood's premiere feature film sound design and editorial companies. Since 1991, the company has amassed more than 500,000 digitally mastered tracks comprising of terabytes (TB). If you've seen *The Prince of Persia*, *X-Men Origins: Wolverine*, *3:10 to Yuma*, or *The X-Files: I Want to Believe*, you've heard Sound Dogs' work.

In 1996 Sound Dogs found itself at a crossroads. The company realized that due to rising labor costs, it needed an additional revenue source to finance the ongoing development of its sound effects library. It also recognized that the market for sophisticated sound effects and production music was growing outside the traditional customer base of the Hollywood film community. Web site builders, game developers, and television and video editors were clamoring for high-quality sounds.



The founders of the company reasoned that if they could find a way to be both the supplier and distributor without having to pay for day-to-day labor, they could fund improvements to the sound effects library. The problem was that traditional distribution methods forced customers to purchase entire CDs of sound effects just to get the few sounds they needed. Sound Dogs needed a system that could support integrated supply and distribution, as well as selective purchasing capabilities for customers.

The solution: Making the move to e-Commerce

The answer to Sound Dogs' dilemma was an automated e-commerce Web site that would enable customers to buy whatever they needed, when they needed it. The long list of goals that Sound Dogs wanted to accomplish with the system included:


- Publish the existing sound library in an advanced media distribution format.
- Enable customer to buy online only the sound effects they need and download them immediately in any popular sound format.
- Generate additional revenue with minimal labor or maintenance.
- Make the sound library accessible to existing film production clients anytime and anywhere.

Sound Dogs teamed up with Brite Global, Inc., a Microsoft Gold Certified Partner based in Beverly Hills, CA. Brite Global designs and implements enterprise-wide information management systems based on Microsoft technologies, and specializes in Custom Software Development, Web Development and e-Commerce Solutions, Portals and Collaboration and Customer Relationship Management solutions.

Sounddogs.com was created as an online e-commerce web site that features a massive sound effects and production music library with advanced search capabilities. This site, which has been operational since 1997, enables customers to search for, preview, order, purchase and retrieve a wide range of sound effects and production music delivered in various formats and sample rates. With sounddogs.com, the company successfully made the shift from a services-only company to a mass market online retailer, receiving critical acclaim from the film industry, major manufacturers and other customers.

Building a Windows DNA Web Solution

When the originally web site was built in 1996, development platform options were very limited. According to Aric Levin, VP of Technology and Chief Software Architect at Brite Global, *"Perl/Unix was a poor solution for high-end web development at that time, so we opted for Microsoft Windows NT"*. Among other benefits, Levin lists scalability, tight integration with Microsoft SQL Server, the ease of Web application development, the support of the Component Object Model (COM) as the key reasons for choosing the Windows NT platform (currently sounddogs.com runs on multiple Windows 2003 servers). He also states. *"Windows NT has a greater developer*



base that other platforms. Components and third-party applications are also widely available, which helps speed development; and support from Microsoft is readily available and very helpful in application development."


In 2002 the web site was upgraded to a Windows DNA 2000 solution based on the Microsoft Windows operating system. Levin explains, "*The web site was getting a lot of traffic and we needed to add additional servers. We decided to implement Windows 2000 for many reasons, including its better reliability and performance, superior scalability, enhanced remote access, better performance from Microsoft Transaction Services/Internet Information Services applications, better management and improved COM+ in the middle tier of all applications.*"

After the release of Visual Studio 2005 and the .net Framework 2.0, portions of the web solution were upgraded again due to additional demand from the users and partners, and enabled the support the new features of the .net Framework, Web Services, Enterprise Services (COM+). The web application continued to operate as a legacy asp application with COM+ in the middle tier, but the order processor, audio converter and other business objects were upgraded.

Self-Serve Sound Effects

Sounddogs.com is a fully automated, self-serve web site that consists of four key applications – two of the running online (with web presence) and two of the running within the internal network:

- **Sound Clip Retrieval:** an online web based application (with COM+ in the middle-tier) is the heart of the system. It enables customers to search for sounds by keywords or categories and then place an order.
- **Preview Application:** This application is obsolete in its current version. The application generated preview files on the fly. Using ADO, the preview application accesses sound clips based on the customer's criteria from a SQL Server database, and used a third party library with a custom tailored COM application to handle the sound conversions, copy a portion of the sound files into a temporary location and pipe the sound file to the customer's browser for preview in a variety of popular sound formats including WAV, AU, AIFF, ASF, WMA, MP3 and SD2.
Currently previews are created when files are imported into the system, thus the need for a dynamic preview application is no longer necessary.
- **Catalog:** this is the vast sound library stored in Microsoft SQL Server and external Hardware RAIDs
- **Order Processor:** The order processor is comprised of a .net Framework web service and multiple middle-tier COM+ objects running in the background on a separate server from the web site. The order processor receives the order information from the SCR (Sound Clip Retrieval) application, picks up the order information, charges the customer account using a third-party payment processor, and once the order has been verified, the conversion of the sound files is executed, and the users receive e-mail (and browser) confirmations of the location where the sound files are available for download via http or ftp.



Additional middle-tier and administration applications are involved in the process, but not considered as key applications, thus omitted.

See How It Runs

Sounddogs.com is a robust Windows DNA solution that relies on a group of core Microsoft products that include: Windows 2003 Server – with Internet Information Services and COM+, Microsoft SQL Server 2005, Microsoft Exchange Server 2003, Microsoft ISA Server 2004, Microsoft Visual Studio 2005 and 2008.

In the original Windows NT incarnation, sounddogs.com resided on a single server. To accommodate the need to scale out the current web site and the various applications that operate around it are hosted on 6 multi-core multi-processor servers running Windows 2003 and with an external RAID for data storage. According to Levin, *"The support that Windows 2003 has for multiprocessing machines really improved the scalability of the application. By using dual and quad Intel Xeon machines, we can handle more simultaneous requests than before."*

Built with Microsoft Development Tools

Brite Global development sounddogs.com using the Microsoft Visual studio, including Microsoft Visual C++, Microsoft Visual Basic, Microsoft C#, and Visual Interdev in its earlier versions. It took approximately four months for three enterprise developers to build this site from the ground up. According to Aric Levin, *"In its original version we used Microsoft Visual Basic to write the web application (Sound Clip Retrieval) and the COM objects to communicate between the applications and the database. Developing components with Windows 2000 (and Windows 2003) and Visual Basic for database access really improved the performance of our application."* He goes on to say, *"Visual Basic provides a great rapid application development environment and easy debugging. It is one of the best and easiest tools to use out there."* In its current version most of the back-end code has been replaced with Microsoft Visual C# and the .net Framework 2.0. The debugging, intellisense and rapid application development capabilities have been greatly enhanced.

Levin continues, *"We used Visual C++ to create a library that converts sound files to the user-desired formats. It is a COM component accessible by the order processing and preview applications. We used Visual Interdev to create administration functionality to remotely manage the server. Visual Source Safe was also used to allow handling the work for multiple developers."*




Three-Tier Partitioning for a Sound Foundation

The Microsoft Windows DNA platform supports the concept that distributed applications should be logically separated into multiple partitions or tiers: presentation (or user interface), business logic, and data. Partitioning an application increases its scalability and makes the application easier to manage and update.

Levin explains it this way: *"The concept of multi-tier architecture increases the performance of any system very significantly. In terms of development, Windows DNA enables you to separate your development efforts and work only with the components involved at the time so you can deal with each tier separately. In addition, when you use Windows DNA, any time you make changes, it automatically updates everything. You don't have to apply changes to separate machines because they're automatically implemented."*

Sounddogs.com uses a three-tier architecture. Here is how sounddogs.com is partitioned and how the three tiers work together:

- **Presentation Tier.** This consists of the user interface (UI), which is HTML based and displayed directly to the user's browser. The application supports the most commonly used browsers (Internet Explorer, Mozilla Firefox, Safari, Netscape) or any other browser that supports JavaScript and cookies. The original UI was built using Visual Interdev and Microsoft FrontPage, however later versions were built using Visual Studio and the .net Framework. Several of the administration applications were built using Visual Basic 6.0 and later on the Visual C# and the .net Framework.
- **Middle (Business/Data Logic) Tier.** The three key applications that take advantage of the middle tier are the Sound Clip Retrieval, Preview application (obsolete) and the Order Processor. The Sound Clip Retrieval application is the web application that gives the users the look of the site when they search and order sound effects and music. The Visual Basic middle tier application communicates with Internet Information Services and passes the content back to the presentation tier. The preview application (now part of the import application), verifies if the current user has been given access to preview files. If so, it pipes out the requested files prior to ordering, allowing the user to verify that this is what they intend to order. The order processor handles the order once the user has completed the request. It gathers the user information from the web service, charges the credit card (or other credit options are available), converts the sound files to the desired format, and places the files in a hidden FTP directory. The order processor then sends the user a confirmation message via Microsoft Exchange with order information and links to the downloadable sound files (available via HTTP and FTP protocols). In the current version, this information is displayed directly on the web page as well. All three business logic applications use COM+ and DCOM to communicate with the data tier.
- **Data Tier.** There are two main components that built up the data tier: the SQL Server database and the file server. The SQL Server database holds all information about the users (in encrypted format), sound file information (such as categories, catalog items and search methodology), and order information and history. Says Levin, *"Of course we use triggers and stored procedures for code reuse and performance."* The




file server is an external RAID with over 10 Terabytes of data stored in Sound Designer format. We have built new conversion application that will allow us to support multiple formats as well as store the files as Broadcast Wave, which will allow support for polyphonic files (multiple channels). With regards to accessing the data, Levin points out, *"We use the latest versions of ActiveX Data Objects (ADO) and ADO.NET, Microsoft's latest data access object technology, to access data of different types in different environments. From our testing, we believe that ADO is the fastest and most reliable data environment available on the Windows Platform."*

Benefits

Sounddogs.com is an unequivocal success, both from a business and technical perspective. The company's business has grown incredibly since the initial launch of the web site in 1997. In 1998 gross sales were nearly 500 percent higher than 1997, and in 1999 gross sales were more than 97 percent greater than 1998. The 2000 sales have continued this staggering growth curve.

Aric Levin is very vocal about the many technical benefits that the Windows DNA platform has given to Sound Dogs:

- **Better performance.** *"By upgrading to Windows 2000 (Windows 2003) and adding additional servers to distribute the bandwidth, we increased performance for our users significantly. The performance is extremely superior now."*
- **Interoperability.** *"To build sounddogs.com we used several third-party applications. It was easy to integrate them into the solution. You just plug in parameters and the rest takes care of itself. You don't want to have to spend two months in creating a component, when you can buy it off the shelf at a very economical cost. This saves a lot of time in effort in development."*
- **Scalability.** *"By moving from a single server solution to a system of multiple servers, the web site is much more scalable. User experience is much better."*
- **Availability.** *"Before, when we had to do maintenance, we had to shut down the server. Now, downtime is a thing of the past. The only time we have to bring down the server is for application upgrades, and even that is minimal. Windows 2000 (Windows 2003) is very reliable, so crashes do not happen anymore."*
- **Manageability.** *"Administration is a lot easier now as well. The availability of administration tools from the Windows server and the resource kit make it very easy to manage the server."*
- **Network security.** *"By placing only the components that are required to be available to the users on the Internet, and keeping everything else inside the internal network, the entire solution is highly secure. Sensitive data is stored on servers that are not accessible from the internet. We also take advantage of Secure Socket Layers (SSL) to protect sensitive information. In addition the use of ISA Server as a Firewall and VPN access, minimizes the number of potential attacks on the server."*

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- **Remote server accessibility.** *"I absolutely love remote server accessibility. Microsoft Windows Terminal Services is the greatest thing since breakpoints. It gives us the ability to manage the system and servers through a Virtual Private Network (VPN) from anywhere. This save a lot of time and money. No need to drive to the data center for server maintenance, or pay high administrative fees like in old days. Anything can be done remotely, and with the high speed of the Internet today, you feel like you are onsite."*
 - **Speed of development.** *"Everything about Windows DNA helps speed development, from the architecture and programming model to the great application services and development tools, it helps us to get solutions to market a lot faster. In fact, the entire sounddogs.com web site took only 12 months (3 developers x 4 months) to complete, and we easily transferred our knowledge from Windows NT and COM to Windows 2000/2003 and COM+."*

The Future Sounds Great

While the Web site has been very successful for Sound Dogs, improvements and additions are ongoing. Along with getting more of the sound effects library online, Sound Dogs has already added new file formats, such as Windows Media Audio, Active Streaming Format (ASF), and MP3 and MP4. Levin says, *"We may also incorporate XML (extensible markup language) to work with partners such as UPS for shipping."* He talks about other developments: *"The Sound Dogs database is so vast that we've developed a remote database application that will be hosted on the client's computer. The database will link to sounddogs.com's massive sound file library."*

Looking towards the future, Sound Dogs and Brite Global will continue upgrading their technologies following the Windows DNA 2000 guidelines. A few of the Microsoft products that will most likely be used as they become available include Commerce Server, SharePoint Server and more recent versions of Windows Server, SQL Server, Exchange Server and Visual Studio.

In addition, Sound Dogs and Brite Global have developed drag-and-drop technology for Avid Technologies' Media Composer using OMM™ (Open Media Management) technology that's based on XML. Levin adds, *"We'll also be incorporating a new strategy that will allow suppliers to add their sound file formats to our library remotely. The Windows DNA platform makes it possible for us to better integrate and deploy this technology."*

For More Information

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